

REMARKS

In view of the above amendments and the following remarks, reconsideration and further examination are respectfully requested. In this regard, Applicant submits that the above amended claims are supported by the application as originally filed.

I. Status of All of the Claims

Applicant confirms that this non-final first Office Action is based on pending claims 23 to 43 in the application, with all claims being rejected. These claims are presently being considered on the basis of an earlier-filed Preliminary Amendment which cancelled originally-filed claims 1 to 22 and added the same. In brief response, Applicant traverses the rejections and, without conceding any point, submits the above amendments and the following arguments and explanations in support of the patentability of the current claims.

II. Claim Rejections-35 USC 102(b)-Anticipation

In particular, claims 23-43 stand rejected in this Action under 35 USC 102(b) as being fully anticipated by Wu (US Pat. No. 5,391,426) or Maples (US Pat. No. 6,395,383), which were cited by Applicant in an Information Disclosure Statement filed on February 22, 2005. In response, Applicant traverses the same and initially points to the fact that independent claims 23 and 38 are substantially amended herein, along with various other amendments and cancellations of pending dependent claims as appropriate. Applicant will further respond in arguments below to specific comments by the Examiner and will address the cited references as to their deficiencies taken alone or in combination in this context.

For example, focusing on the independent claims, in order to further clarify and delimit the present claimed invention and distinguish from the prior art, Applicant has introduced new features into amended claim 23 including the following:

- Applicant has further specified the barrier layer of the claimed inventive adsorbing material in so far as it *forms a continuous, uninterrupted layer on the carrier material, the thickness of the barrier layer being in the range from 1 to 500 μm* , as was originally disclosed in then pending claim 32.

- Furthermore, the feature has been introduced into amended claim 23 that *the barrier layer is permeation resistant to chemical poisons and warfare agents in that it prevents or at least retards the passage of chemical poisons and warfare agents*, as was disclosed in paragraph [0019] of the published patent application (US 2005/0266749 A1).
- With respect to the adsorbing layer of the claimed inventive adsorbing material, the feature has been introduced that the adsorbing layer is *based on activated carbon*, as was disclosed in pending claim 33 in conjunction with paragraphs [0010], [0018] and [0022] of the published patent application.
- Furthermore, the specific configuration of the barrier layer has now been specified in amended claim 23 according to the following:
 - Applicant has introduced the feature that the barrier layer being formed as a multilayered laminate or as a multilayered composite comprises at least *three* interconnected layers or plies, from then pending claim 24.
 - Next, the feature has been introduced that *the multilayered laminate or the multilayered composite comprises a core layer and two outer layers, connected to the core layer*, as originally found in pending claim 25.
 - The feature has also been introduced that *the core layer is formed on the basis of a cellulose- or polyurethane-based polymer*, from then pending claim 26.
 - Finally, the feature has been introduced into amended Claim 23 that the two outer layers connected to the core layer are formed *on the basis of a polyurethane*, from then pending claim 28).

By these amendments in pending claim 23, Applicant submits that the Examiner's objections that the present claims are not patentable over the prior art documents cited in the outstanding Office Action should have been overcome and that such rejections should now be removed. For, as discussed hereinafter in more detail, Applicant submits that none of the prior art documents refer to a specific adsorbing material in the sense of the present claimed invention

comprising a specific barrier layer in combination with an adsorbing layer on the basis of activated carbon in the sense of amended claim 23. Applicant also submits that the same reasoning and arguments apply for the allowability of independent claim 38 as similarly amended herein. Moreover, Applicant submits that the rejections of remaining dependent claims 29-37 and 39-43 should also now be withdrawn and that such claims should be allowed as well based at least on their dependency from allowable independent claims 23 and 38.

By way of further explanation only, and not intended to be exclusive or limiting in any way, Applicant would also point the Examiner to the discussion of prior art on which the present invention is based in the text passages such as paragraphs [0002] to [0008] of the published application. In this context, it is explicitly stated *inter alia* that there are in principal three types of protective suits, one type of which concerns protective suits which are equipped with a membrane which is pervious to water vapor but not to different types of poisons. Based on the prior art and its disadvantages, certain objects intended to be solved by embodiments of the present invention are described, for example, in paragraphs [0009] to [0012] of the published application which are accomplished by having an adsorbing material according to amended independent claims 23 and 38 and also to the remaining dependent claims therefrom.

With respect to amended claim 23, for example, it has already been pointed out that some of what is new and also inventive over the prior art is the fact that the inventive adsorbing material is provided with a barrier layer comprising at least three interconnected layers or plies in combination with an adsorbing layer on the basis of activated carbon. Due to this combination of features, the claimed adsorbing material exhibits excellent properties with respect to a protective function against chemical poisons and warfare agents, thereby providing a high wear comfort due to the high gas perviousness.

In this context, embodiments of the inventive adsorbing material as now claimed, for example as producing the protective materials in claims 42-43, provide various advantages which are yet further indications in support of the patentability of Applicant's claims over the prior art. By way of example only, Applicant points the Examiner to the following:

- The barrier layer envisioned according to certain embodiments of the invention is a layer which is highly permeable to water vapor yet whose permeability to poisons or warfare agents is low, as discussed at paragraph [0024] of the published application.

- Due at least in part to the fact that a multilayered laminate or a multilayered composite is used with respect to the barrier layer, it is also possible in some embodiments to intercombine barrier layer materials each having different properties resulting in an optimization as mentioned at paragraph [0028] of the published application.
- Furthermore, the use of a cellulose-based polymer to form the barrier layer especially as a core material layer and in a composite with two polyurethane-based outer layers, for example, can have one or more of the following additional advantages:
 - First, cellulose and cellulose derivatives are excellent barrier layer materials especially with regard to chemical agents, such as warfare agents (Hd etc.), and are neither attacked nor dissolved by these materials.
 - Secondly, polyurethane-based outer layers prevent migration or diffusion of any plasticizers present in the core layer and also muffle the rustling which can occur in wearing such a protective material and which can be due to the cellulose-based core layer as discussed at paragraph [0029] of the published application.
- The fact that the barrier layer as claimed, which offers permeation resistance to chemical poisons and warfare agents in that it prevents or at least retards the passage of the same, also constitutes the bonding layer for the adsorbing layer provides a not inconsiderable saving in basis weight since an additional bonding layer is not required. In addition, it also at least for the same reason simplifies and improves the economics of the manufacturing operation since no additional application of a separate bonding layer is required, as mentioned at paragraph [0019] of the published application.
- Finally, the good wear properties of the adsorbing material according to embodiments of the present invention are additionally enhanced by the buffering action of the activated carbon since it is a moisture/water straw or buffer as discussed at paragraph [0022] of the patent application.

Now with specific regard to the prior art references cited by the Examiner in this Action, Applicant submits that neither of the references in fact discloses and thereby anticipates an adsorbing material or its process for production or use as a protective material provided with, for purposes of example only, a barrier layer and an adsorption layer as now claimed in amended independent claims 23 and 38 and in the dependent claims therefrom. Nor does a combination of

these references render the claimed subject-matter obvious to a person of ordinary skill in the art at the time of Applicant's invention. In particular, Applicant submits the following specific comments to inform and assist the Examiner with regard to these references:

As to **U.S. Patent No. 5,391,426** (*Wu*), *Wu* refers to a material for absorbing noxious gases while having a good water vapor transmission rate which comprises a suitable flexible substrate of a textile material or a porous organic polymeric membrane having a coating or film on it made of an organic polymer having active hydrogens which presumably react with reaction sites on the noxious gas compound (See, e.g., claim 1 and abstract).

In this regard, Applicant would first point out that the *Wu* reference was only considered to be a so-called "A-document" with respect to the international search report of the underlying international application PCT/EP 2003/008649, thus defining only the general state of the art which is not considered to be of particular relevance to the claimed invention. One reason for this is no doubt that *Wu* is completely silent with respect to a specific construction of the adsorbing material in contrast to Applicant's present claims. *Wu* instead focuses on a layered structure having a gas-blocking polymeric material on the basis of a crosslinked polyalkyleneimine comprising reactive sites with respect to poisons and warfare agents (cf., claim 1 and lines 16 to 19 in column 3 of the *Wu* reference).

Secondly, *Wu* is completely silent with respect to a multilayered structure comprising a core layer on the basis of cellulose as performed with respect to the present claimed invention. According to the text passage in column 3, lines 47 to 62 as delineated by the Examiner, *Wu* discloses the use of a polyurethane layer. However, in contrast to Applicant's claims, *Wu* teaches to use only one single polyurethane layer with respect to the layered structure disclosed therein and is thus completely silent with respect to a specific construction according to which two polyurethane-based layers are connected to a core layer of cellulose as recited in Applicant's present claims.

For at least these reasons and more, *Wu* therefore refers to a material that is completely different with respect to Applicant's inventive adsorbing material as well as its process for manufacture and use as protective material. Consequently, *Wu* is not believed to be pertinent and certainly not anticipatory with respect to the present claimed invention as recited in amended independent claims 23 and 38 and also in the dependent claims therefrom.

Finally as to **U.S. Patent 6,395,383 B1** (*Maples*), *Maples* refers to a chemical protective covering comprising a selective permeable sheet comprised of a polyamine polymer wherein at least 10 % of the polyamine polymer amines are amine-acid moieties wherein the acidic species of said amine-acid moieties have a pK_a less than 6.4 (See claim 1 and abstract). Thus, *Maples* only refers to the use of very specific materials for the barrier layer which are completely different to those of Applicant's present claims. For example, the materials according to *Maples* are based on specific amine polymers having specific acidic properties, and both its disclosure and teaching for prior art purposes are thereby restricted to this specific embodiment.

Maples also explicitly teaches away from Applicant's present claims since the use of additional adsorption materials are to be avoided according to *Maples*. In this context, it is said on column 2, lines 1 to 32 of *Maples*:

"Adsorptive chemical protective systems work by adsorbing hazardous liquids and vapors into sorbants, thus inhibiting them from reaching that which the systems are intended to protect. One limiting characteristic of sorbants is that they possess a finite capacity to adsorb chemicals. A second limiting characteristic of sorbants is that they will indiscriminately adsorb chemical species for which protection is unnecessary, thus reducing the available capacity for adsorption of the chemicals to which they were intended to provide protection.

The finite capacity and indiscriminate adsorption characteristics of adsorptive systems limit their duration of use and storage life. Adsorptive systems will begin to adsorb various chemical vapor contaminants present in the atmosphere upon exposure, thus progressively reducing their available capacity over time. Thus limits their duration of use. This process can even occur when the adsorptive systems are kept within sealed packages over long spans of time. This limits the storage life of such materials.

Additionally, the finite capacity and indiscriminate adsorption characteristics necessitate the incorporation of relatively large quantities of sorptive elements within a chemical protective covering in order to achieve and sustain adequate levels of protection. This can result in thick and heavy barrier systems that can have high resistances to heat and moisture transfer and can impose undesirable physiological

stresses on the wearer. Thus, adsorptive systems are also restricted by a trade-off between protection and comfort.

Furthermore, increased bulk and weight are also undesired characteristics for the packaging, storage, handling, and transportations of these materials."

From at least this discussion, Applicant submits that it is clear that *Maples*' only focus is on the presence of a barrier layer without any adsorption materials such as is recited in Applicant's amended claims in this application.

Furthermore, Applicant submits that *Maples* does not at all teach to provide a barrier layer in the sense of a multilayered structure with different layers having different barrier properties. For example, it has to be denoted that the polyamine polymer in *Maples* is to be combined with **open pore** polytetrafluoroethylene substrates (emphasis supplied). Due to their open pore structure, these substrates cannot constitute a barrier layer in the sense of Applicant's present claims. In this context, for example, it reads on column 4, lines 57 to 62 of *Maples*, "[i]n another embodiment of the invention, the chemical protective covering is comprised of two water vapor permeable open pore polytetrafluoroethylene substrates and a polyalkyleneimine-containing polyamine polymer with amine-acid moieties specifically involving H_2SO_4 and at least 25 % of the polyamine polymer amines." Therefore, for at least these reasons and more, *Maples* is also not believed to be pertinent with respect to Applicant's present invention as claimed in amended independent claims 23 and 38 and in the dependent claims therefrom either from an anticipatory or obviousness standpoint.

Accordingly, Applicant submits overall that none of the prior art documents anticipate or suggest a combination of the inventive features of amended claim 23. The same applies to amended independent claim 38 and to their respective dependent claims including those dealing with the inventive process and the inventive protective material comprising the adsorption material of the invention. In this context, Applicant further submits that even a combination of the aforementioned documents would not lead to the subject-matter of the present claims since both cited documents refer to materials that are completely different from those now claimed. Moreover, Applicant submits that the skilled practitioner would not consider the aforementioned documents with respect to the present claims since while *Wu* on the one hand discloses a protective material with functional properties based on a concept totally different from that of

Applicant's claims, i.e., a chemical interaction of gas of poisons with a specific barrier layer compulsorily comprising a crosslinked polyethyleneimine, *Maples* on the other hand, explicitly teaches away from the present claims to avoid the use of additional adsorption materials and also discloses a protective material having a structure that is completely different from that of Applicant. In fact, it is to the merit of Applicant to have provided, for the first time, a gas perviousness adsorbing material combining a specific claimed barrier layer with a specific claimed multilayer structure and an adsorbing layer on the basis of activated carbon resulting in an impressive improvement of the protective function thereby providing a high wear comfort due to the high permeability to water vapor.

For at least these reasons and more, Applicant therefore believes that on the whole the claimed subject-matter herein is both novel and inventive over the cited references in this Action. Applicant would also call the Examiner's attention to the fact that with respect to the parallel European prosecution, the patentability of the subject-matter of Applicant's claimed invention has been acknowledged and that a European patent EP 1 531 929 B1 has been granted, a copy of which is provided with this Response. Furthermore, also with respect to the parallel German proceeding, a patent has been granted. However, Applicant would call attention to an opposition that was raised against the German patent, in which further references have been introduced which are being submitted to the U.S. Patent and Trademark Office in a supplemental Information Disclosures Statement for the Examiner to consider as well.

III. Conclusion

It should be understood that the above remarks are not intended to provide an exclusive or exhaustive basis or arguments for patentability or to concede the basis for any of the rejections in this Office Action. Instead, these remarks are simply provided by way of explanation and example to overcome the rejections made in the Action in the most expedient fashion. Therefore, at least in view of the above amendments and remarks, Applicant respectfully submits that the present application is in condition for allowance and an early notice of allowance is earnestly solicited. If after reviewing this Response the Examiner feels that any issue remains which must be resolved before the application can be passed to issue, the Examiner is invited to

contact the undersigned representative by telephone in the hope of resolving the same without the need for further filings or delay.

Respectfully submitted,

By: /Charles R. Reeves/
Charles R. Reeves, 28,750
Woodard, Emhardt, Moriarty,
McNett & Henry LLP
111 Monument Circle, Suite 3700
Indianapolis, Indiana 46204-5137
Telephone number (317) 634-3456
Facsimile number (317) 637-7561

Attachment